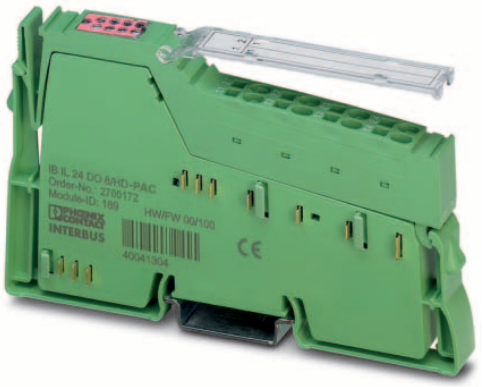
# IB IL 24 DO8/HD-PAC



## Inline digital output terminal, 8 outputs, 24 V DC, 500 mA

**AUTOMATION**

Data sheet
7985_en_02

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## 1 Description

The terminal is designed for use within an Inline station. It is used to output digital signals.

**Features**

- Connections for eight digital actuators
- Connection of actuators in 1-wire technology
- Nominal current per output: 0.5 A
- Total current of the terminal: 4 A
- Short-circuit and overload protected outputs
- Diagnostic and status indicators

| | |
|---|---|
| | This data sheet is only valid in association with the IL SYS INST UM E user manual. |
| | Make sure you always use the latest documentation.<br>It can be downloaded from the product at www.phoenixcontact.net/catalog. |

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# 3 Ordering data

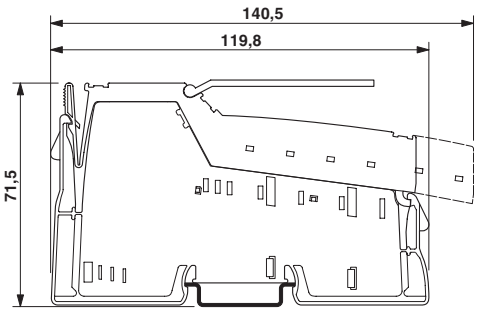
| Description | Type | Order No. | Pcs./Pkt. |
|---|---|---|---|
| Inline digital output terminal, complete with accessories (connector and labeling field), 8 outputs, 24 V DC, 500 mA, single-wire connection method | IB IL 24 DO8/HD-PAC | 2700172 | 1 |

| Accessories | Type | Order No. | Pcs./Pkt. |
|---|---|---|---|
| Connector, for digital 1, 2 or 8-channel Inline terminals ( Plug/Adapter ) | IB IL SCN-8 | 2726337 | 10 |
| Labeling field, width: 12.2 mm ( Marking ) | IB IL FIELD 2 | 2727501 | 10 |
| Inline terminal for power distribution (GND), complete with accessories, (connector and labeling field) connections for GND | IB IL PD GND-PAC | 2862990 | 1 |
| VARIOFACE front adapter for 8-channel Inline HD modules ( Plug/Adapter ) | FLKM 14-PA-INLINE/DIO8 | 2900889 | 1 |

| Documentation | Type | Order No. | Pcs./Pkt. |
|---|---|---|---|
| User manual, English, Automation terminals of the Inline product range | IL SYS INST UM E | - | - |
| Data sheet, English, INTERBUS addressing | DB GB IBS SYS ADDRESS | - | - |

# 4 Technical data

## Dimensions (nominal sizes in mm)




| | |
|---|---|
| Width | 12.2 mm |
| Height | 119.8 mm |
| Depth | 71.5 mm |
| Note on dimensions | Housing dimensions |

## General data

| | |
|---|---|
| Color | Green |
| Weight | 60 g ( With connector ) |
| Operating mode | Process data mode with one byte |
| Ambient temperature (operation) | -25 °C ... 55 °C |
| Ambient temperature (storage/transport) | -25 °C ... 85 °C |
| Permissible humidity (operation) | 10 % ... 95 % (according to DIN EN 61131-2) |
| Permissible humidity (storage/transport) | 10 % ... 95 % (according to DIN EN 61131-2) |
| Air pressure (operation) | 70 kPa ... 106 kPa (up to 3000 m above sea level) |

| General data | |
|---|---|
| Air pressure (storage/transport) | 70 kPa ... 106 kPa (up to 3000 m above sea level) |
| Degree of protection | IP20 |
| Protection class | III, IEC 61140, EN 61140, VDE 0140-1 |

| Connection data | |
|---|---|
| Name | Inline connectors |
| Type of connection | Spring-cage connection |
| Conductor cross section solid / stranded | 0.08 mm² ... 1.5 mm² |
| Conductor cross section [AWG] | 28 ... 16 |

| Interface Inline local bus | |
|---|---|
| Type of connection | Inline data jumper |
| Transmission speed | 500 kbps |

| Power consumption | |
|---|---|
| Segment supply voltage $U_S$ | 24 V DC (nominal value) |
| Current consumption from $U_S$ | max. 4 A DC |
| Communications power $U_L$ | 7.5 V DC |
| Current consumption from $U_L$ | max. 45 mA |
| Power consumption | max. 0.34 W (at $U_L$) |
| Power loss | max. 0.62 W |

| Digital outputs | |
|---|---|
| Number of outputs | 8 |
| Type of connection | Spring-cage connection |
| Connection method | 1-wire |
| Output voltage | 24 V ($U_S$ - 1 V) |
| Maximum output current per channel | 500 mA |
| Maximum output current per device | 4 A |
| Nominal load, ohmic | 12 W (48 Ω) |
| Nominal load, inductive | 12 VA (1.2 H; 50 Ω) |
| Nominal load, lamp | 12 W |
| Signal delay when switching on an ohmic nominal load | Typ. 500 µs |
| Signal delay when switching on an inductive nominal load | Typ. 100 ms (1.2 H; 50 Ω) |
| Signal delay when switching on a lamp nominal load | Typ. 100 ms |
| Signal delay when switching off an ohmic nominal load | Typ. 1 ms |
| Signal delay when switching off an inductive nominal load | Typ. 50 ms (1.2 H; 50 Ω) |
| Signal delay when switching off a lamp nominal load | Typ. 1 ms |
| Maximum operating frequency with ohmic nominal load | max. 300 Hz (this switching frequency is limited by the data rate selected, the number of bus devices, the structure of the bus, the software used and the control or computer system used) |
| Maximum operating frequency with inductive nominal load | max. 0.5 Hz |
| Maximum operating frequency with lamp nominal load | max. 8 Hz (this switching frequency is limited by the data rate selected, the number of bus devices, the structure of the bus, the software used and the control or computer system used) |
| Reaction time with short-circuit | ca. 1 s |
| Reaction time with ohmic overload | ca. 3 s |
| Behavior at voltage switch-off | The output follows the power supply without delay |
| One-time unsolicited energy | 300 mJ |
| Limitation of the voltage induced on circuit interruption | -15 V ≤ $U_{demag}$ ≤ -45.8 V ($U_{demag}$ = demagnetization voltage) |
| Output voltage when switched off | max. 1 V |
| Output current when switched off | max. 300 µA |

## Digital outputs

| | |
|---|---|
| Behavior with overload | Auto restart |
| Restart frequency with ohmic overload | 400 Hz |
| Restart frequency with lamp overload | 400 Hz |
| Behavior with inductive overload | Output can be destroyed |
| Reverse voltage resistance to short pulses | Reverse voltage proof |
| Resistance to permanent reverse voltage | max. 500 mA |
| Overcurrent shut-down | min. 0.7 A |
| Overload protection, short-circuit protection of outputs | Zener diode in output chip |

## Programming Data

| | |
|---|---|
| ID code (hex) | BD |
| ID code (dec.) | 189 |
| Length code (hex) | 81 |
| Length code (dec.) | 129 |
| Process data channel | 8 bits |
| Input address area | 0 bit |
| Output address area | 8 bits |
| Parameter channel (PCP) | 0 bit |
| Register length (bus) | 8 bits |

For the programming data/configuration data of other bus systems, please refer to the corresponding electronic device data sheet (e.g., GSD, EDS).

## PROFIBUS telegram data

| | |
|---|---|
| Required parameter data | 3 Byte |
| Need for configuration data | 4 Byte |

## Error messages to the higher level control or computer system

| | |
|---|---|
| Short-circuit / overload of the digital outputs | Error message in the diagnostic code (bus) and display (2 Hz) via the LED (D) on the module |

## Electrical isolation/isolation of the voltage areas

| | |
|---|---|
| 5 V supply incoming remote bus/7.5 V supply (bus logic) | 500 V AC , 50 Hz , 1 min |
| 5 V supply outgoing remote bus/7.5 V supply (bus logic) | 500 V AC , 50 Hz , 1 min |
| 7.5 V supply (bus logics)/24 V supply (I/O) | 500 V AC , 50 Hz , 1 min |
| 24 V supply (I/O) / functional earth ground | 500 V AC , 50 Hz , 1 min |

To achieve electrical isolation between the logic level and the I/O area, supply these areas from separate power supply units. Interconnection of the power supply units in the 24 V area is not permitted (see also user manual).

## Approvals

For the latest approvals, please visit www.phoenixcontact.net/catalog.

## 5 Additional tables

| Output characteristic curve when switched on (typical) | |
|---|---|
| **Output current (A)** | **Differential output voltage (V)** |
| 0 | 0 |
| 0.1 | 0.02 |
| 0.2 | 0.03 |
| 0.3 | 0.04 |
| 0.4 | 0.06 |
| 0.5 | 0.07 |

## 6 Internal circuit diagram

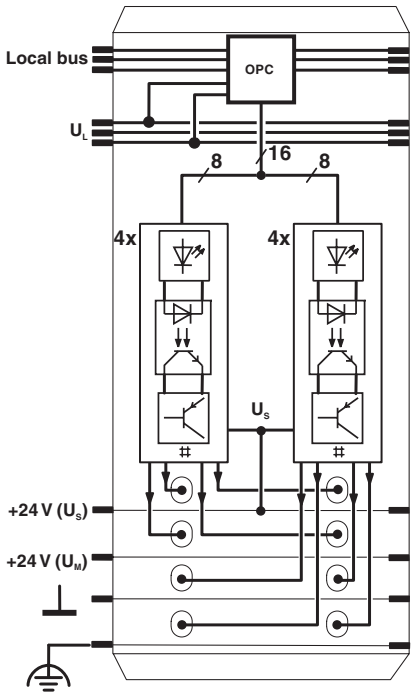
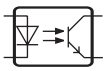



Figure 1 Internal wiring of the terminal points

Protocol chip
(Bus logic including voltage conditioning)

LED (status indicator)



Optocoupler

Transistor

Digital output

Explanation for other used symbols has been provided in the IL SYS INST UM E user manual.

## 7 Local status and diagnostic indicators

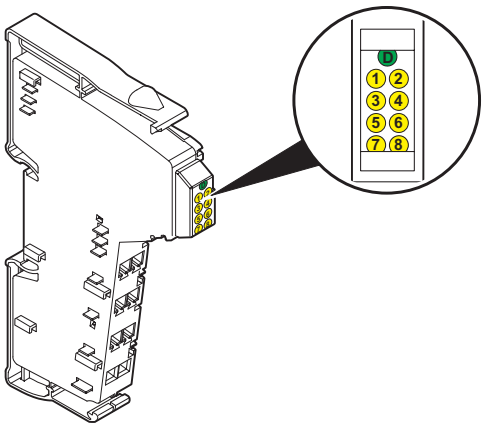



Figure 2 Local status and diagnostic indicators

| Designation | Color | Meaning |
|---|---|---|
| D | Green | Diagnostics (bus and logic voltage) |
| 1 to 8 | Yellow | Status of the outputs |

**Function identification**

Pink

## 8 Terminal point assignment

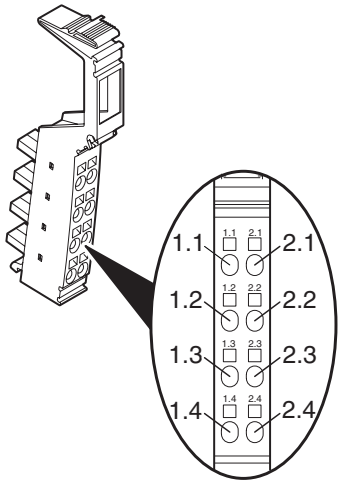



Figure 3 Terminal point assignment

| Terminal point | Assignment |
|---|---|
| 1.1 / 2.1 | Signal output (OUT 1 / OUT 2) |
| 1.2 / 2.2 | Signal output (OUT 3 / OUT 4) |
| 1.3 / 2.3 | Signal output (OUT 5 / OUT 6) |
| 1.4 / 2.4 | Signal output (OUT 7 / OUT 8) |

# 9 Connection notes and examples

When connecting the actuators, observe the assignment of the terminal points to the process data.

**NOTE: Malfunction**

GND of the actuators and GND of the supply voltage $U_S$, which supply the actuators, must have the same potential.

The simplest way to meet this requirement is to use the IB IL PD GND-PAC terminal. Wire the GND connections for the actuators to these terminals. In this way, they are connected with the potential jumper GND of the Inline station.

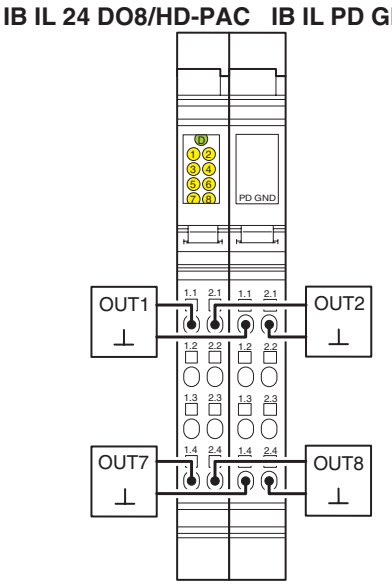



Figure 4 Typical connection of actuators when using the IB IL PD GND-PAC terminal

The actuators can also be connected via external busbars. Ensure that GND of the actuators and GND for $U_S$ have the same potential.

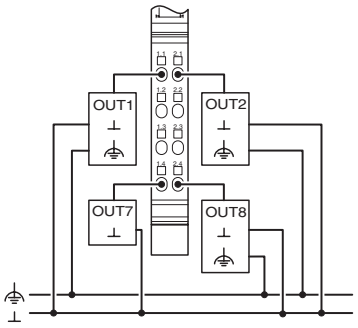



Figure 5 Typical connection of actuators when using external busbars

## 10 Application examples

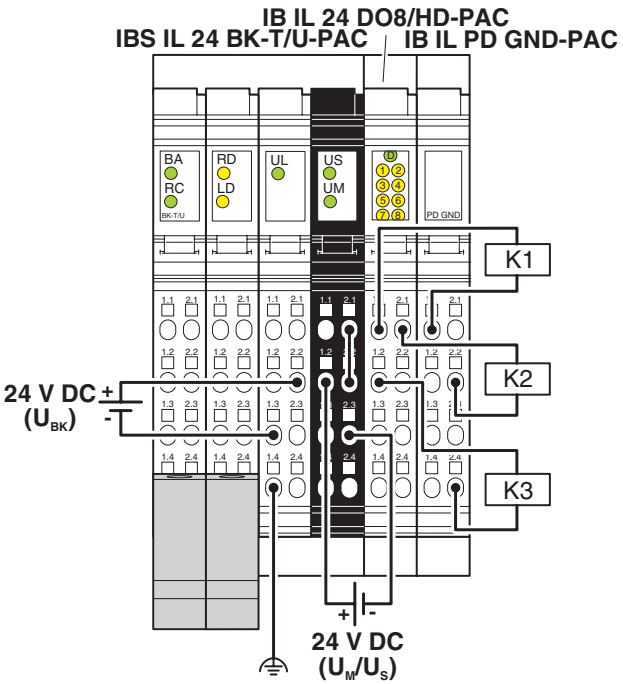



Figure 6 Connection of contactors when using the IB IL PD GND-PAC terminal

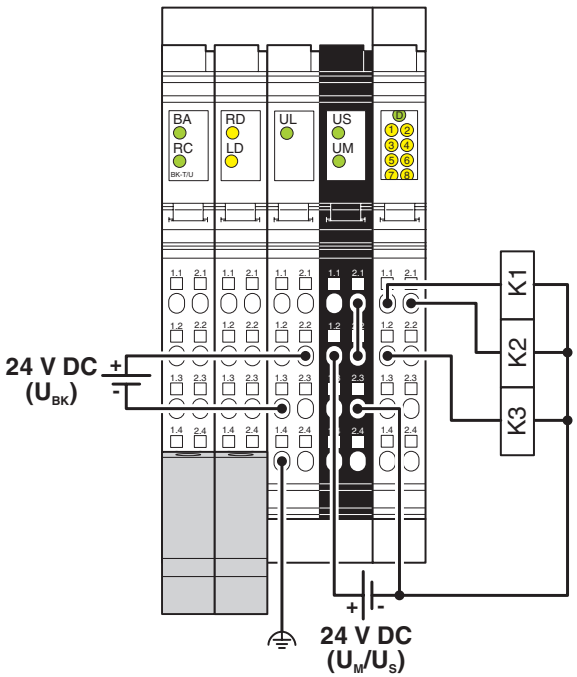



Figure 7 Connection of contactors when using external busbars

## 11 Process data

**Assignment of the terminal points to the output process data**

| (Byte.Bit) view | Byte | Byte 0 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Assign-ment | Terminal point (signal) | 2.4 | 1.4 | 2.3 | 1.3 | 2.2 | 1.2 | 2.1 | 1.1 |
| Status indi-cator | LED | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

For the assignment of the illustrated (byte.bit) view to your INTERBUS control or computer system, please refer to the DB GB IBS SYS ADDRESS data sheet.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